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09/849,880	05/04/2001	Hiroki Taniyama	21943-1017	1101

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EXAMINER

MACARTHUR, SYLVIA

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 09/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

09/849,880

Applicant(s)

TANIYAMA ET AL.

Examin r

Sylvia R MacArthur

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-- The MAILING DATE of this c mmunicati n appears on the c ver sheet with the correspondence address --

**Peri d f r Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 June 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) *lm*
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 1-16 recites the limitation "said target" in line 2 (claims 1, 8, and 11).

There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-6, 11, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Takehiko (JP04206626).

Regarding claims 1 and 33: Takehiko teaches a spin chuck 2 (holding members) which holds and rotates a wafer (target); a first nozzle (6) which supplies a first process

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solution to an edge portion of one surface of the target; a second nozzle (4) which supplies a second process solution to the edge portion of one surface of the target; a sucking hole (see the origin of arrow 7, a sucking atmosphere is present) is provided in the vicinity of the edge portion of the target.

Regarding claim 2: Takehiko illustrates in Fig.1 that the second nozzle supplies the second process solution to a downstream side in the rotational direction of the target from a position to which the first nozzle supplies the first process solution.

Regarding claim 3: The figure further illustrates the second nozzle supplies the second process solution to the outer position from the center of the target.

Regarding claim 4: Both nozzles are provided at an angle of 0 to 90 degrees with respect to one surface of the target.

Regarding claim 5: Both nozzles are also provided in the vicinity of both surfaces of the target.

Regarding claim 6: Furthermore a plurality of each of the first nozzle, second nozzle, and sucking hole are provided around the target.

Regarding claim 11: Takehiko teaches a spin chuck 2 (holding members) which holds and rotates a wafer (target); a first nozzle (4) which supplies a first process solution to an edge portion of one surface of the target; a second nozzle (6) which supplies a second process solution to the edge portion of one surface of the target; a sucking hole (see the origin of arrow 7, a sucking atmosphere is present) is provided in the vicinity of the edge portion of the target.

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6. Claims 1-7, 11, 17-30, 33, and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Taniyama et al (US 6,247,479).

Regarding claims 1 and 33: Taniyama teaches a spin chuck (holding member) 10 which holds and rotates the wafer W (target); a first nozzle (33) and second nozzle (35), and a sucking hole (cup 20, provides the sucking atmosphere).

Regarding claim 2: The second nozzle of Taniyama supplies a second process solution to a downstream side in the rotational direction of the target.

Regarding claim 3: The second nozzle supplies a second process solution to the outer position from the center of the target.

Regarding claim 4: Figure 2 illustrates that the nozzles are at an angle 0 to 90 degrees with respect to one surface of the target.

Regarding claim 5: Both nozzles are in the vicinity of both surfaces of the target.

Regarding claim 6: Furthermore a plurality of each of the first nozzle, second nozzle, and sucking hole are provided around the target.

Regarding claim 7: The first and second nozzle are integrated by the nozzle assembly 31 and are moveable back and forth by the horizontal arm 32.

Regarding claim 11: Taniyama teaches a spin chuck (holding member) 10, which holds and rotates the wafer W (target); a first nozzle (35) and second nozzle (33), and a sucking hole (cup 20, provides the sucking atmosphere).

Regarding claim 17-30: Taniyama teaches a main arm mechanism 5 (transfer device) and a processing apparatus 1.

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Regarding claim 34: Taniyama teaches that the rotational speed (rotation velocity) of the holding member (spin chuck 10) is switched from low level to high level.

7. Claims 1-6, 8-11, 13, 14, and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshio et al (JP 06310422).

Regarding claims 1 and 33: Yoshio teaches a board holding means (holding member), which holds and rotates the rectangular board 1 (target). A supply nozzle (first nozzle) 3 supplies a first process solution to an edge of the target at one surface of the target. A second nozzle 3 is illustrated in Fig. 4. A sucking hole (exhaust pipe) 4 is provided in the vicinity of the edge of the target.

Regarding claim 2: The second nozzle of Taniyama supplies a second process solution to a downstream side in the rotational direction of the target.

Regarding claim 3: The second nozzle supplies a second process solution to the outer position from the center of the target.

Regarding claim 4: Figure 4 illustrates that the nozzles are at an angle 0 to 90 degrees with respect to one surface of the target.

Regarding claim 5: Both nozzles are in the vicinity of both surfaces of the target.

Regarding claim 6: Furthermore a plurality of each of the first nozzle, second nozzle, and sucking hole are provided around the target.

Regarding 8: Yoshio teaches a board holding means (holding member) which holds and rotates the rectangular board 1 (target). A supply nozzle 3 is provided at one surface of the target, while a blocking member 3 is provided to the other surface of the target. See Fig. 1.

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Regarding claim 9: Yoshio illustrates the blocking member is provided in the vicinity of the edge of the other surface of the target.

Regarding claim 10: Yoshio illustrates the blocking member 3 injects fluid to the edge portion of the other surface of the target.

Regarding claim 11: Yoshio teaches a board holding means (holding member), which holds and rotates the rectangular board 1 (target). A supply nozzle (first nozzle) 3 supplies a first process solution to a central portion of a surface of the target. A second nozzle 3 is illustrated in Fig. 4 as supplying an edge portion of the surface of the target. A sucking hole (exhaust pipe) 4 is provided in the vicinity of the edge of the target.

Regarding claims 13 and 14: Yoshio teaches that the second nozzle supplies the process solution to the edge portion of the surface of target at an acute angle (which is inherently between 0 to 90 degrees) to the surface of the target.

### *Claim Rejections - 35 USC § 103*

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takehiko, Taniyama, or Yoshio in view of Rolfson (US 6,506,689).

The teachings of Takehiko, Taniyama, and Yoshio were discussed above.

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All fail to teach a mixture of aqueous hydrogen peroxide and an acid as process solutions.

Rolfson teaches a method for removing contaminants from a wafer by applying cleaning solution to the periphery. Rolfson teaches a solution comprising an acid HCl and hydrogen peroxide and a solution of water.

Rolfson discusses that these cleaning solutions are known suitable edge bead solvents.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to use a solution of water and a solution of an acid and hydrogen peroxide as suitable solvents in an edge beam<sup>d</sup> cleaning solution.

10. Claims 15 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takehiko, Taniyama, or Yoshio in view of Glorioso et al (US 3,953,276).

The teachings of Takehiko, Taniyama, or Yoshio were discussed above.

All fail to teach pipes radially provided on the same plane.

Glorioso et al illustrates pipes radially provided on the same plane and a plurality of nozzles.

Glorioso teaches that the motivation to provide the pipes in the radial orientation is to avoid excessive amounts of the etchant from spilling over and therefore ensures more uniform processing, see col. 5 lines 9-28.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the teachings of Takehiko, Taniyama, or Yoshio to provide a plurality of nozzles and pipes that are radially provided on the same plane as taught by Glorioso et al.



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11. Claims 16 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takehiko, Taniyama, or Yoshio in view of Glorioso et al as applied in claims 15 and 31, and in further view of Kasai et al (US 6,436,193).

The teachings of Takehiko, Taniyama, or Yoshio modified by Glorioso et al were discussed above.

All fail to teach the diameter of each hole increasing from one end of the pipe to another end of the pipe.

Kasai illustrates divergent nozzles in Figs. 3 and 6-10. Kasai teaches that divergent nozzles are advantageous in allowing fluid to be uniformly supplied to the entire surface of the workpiece.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the teachings of Takehiko, Taniyama, or Yoshio in view of Glorioso et al to include teaching the diameter of each hole increasing from one end of the pipe to another end of the pipe.

12. Claims 17-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takehiko or Yoshio in view of Hey et al (US 6,551,488).

The teachings of Takehiko and Yoshio, which included a processing device comprising the first and second nozzles and sucking holes, were discussed above.

Both fail to teach a transfer device.

Hey teaches a processing system comprising processing apparatus with an IBC system 235 is configured to remove unwanted deposits from the edge of the substrate. Hey teaches that substrates are transferred by a robot in the mainframe transfer station 216.

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Robots such as that of Hey are known suitable means of wafer transport in processing system which improve throughput.

Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to utilize a transfer device to transfer wafers (targets) along the processing system such as that of Hey.

***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R MacArthur whose telephone number is 703-306-5690. The examiner can normally be reached on M-F during the core hours of 8 a.m. and 2 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Sylvia R MacArthur  
Patent Examiner  
Art Unit 1763

*Sylvia R MacArthur*  
8/27/03